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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/901,558	07/10/2001	Raphael Rahamim	2875.0580002	4803
26111 7590 08/24/2007 STERNE, KESSLER, GOLDSTEIN & FOX P.L.L.C. 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			EXAMINER SINGH, RAMNANDAN P	
			ART UNIT 2614	PAPER NUMBER
			MAIL DATE 08/24/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<div style="border: 1px solid black; width: 150px; height: 20px; margin: 0 auto;"></div> <p style="text-align: center;"><b>Office Action Summary</b></p>	<b>Application No.</b> 09/901,558	<b>Applicant(s)</b> RAHAMIM ET AL.	
	<b>Examiner</b> Ramnandan Singh	<b>Art Unit</b> 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 May 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 59,66-71,77,83-88 and 94-100 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 59,66-71,77,83-88 and 94-1009 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |                                                                                                            |                                                                                         |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____                                                |

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on May 25, 2007 has been entered.

### ***Response to Arguments***

2. Applicant's arguments filed May 25, 2007 have been fully considered but they are not persuasive.

Applicant's argument---However, Swisher makes it very clear that its receive channel is not single-ended and/or does not include conversion from a differential input signal to a single-ended signal" on page 9.

Examiner's response---Examiner respectfully disagrees. In this context, Applicants are directed to col. 3, lines 48-57 of Swisher, wherein

Swisher converts a receive differential signal into a single-ended signal and a transmit single-ended output into a differential signal.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 59, 66, 77, 83 and 94 are rejected under 35 U.S.C. 102(e) as being anticipated by Swisher [US 6,385,253 B1].

Regarding claim 59, Swisher teaches an analog-front-end (AFE) for a digital subscriber line (DSL) modem shown in Fig. 3, the analog-front-end comprising:

a single-ended receive channel having a line receiver (317);

a single-ended transmit channel (Tx); and

a converter configured to convert a differential input signal from a twisted pair telephone line (130) to a single-ended input signal for the receive channel having a line receiver (317) , and convert a single-ended output from the transmit channel (Tx) to a differential output signal for transmission on the twisted pair telephone line (130) , wherein this converter is **inherent** in the Analog Front End (AFE) of Swisher, and the converter function is **inherently performed** within the segment of the block diagram comprising blocks 345, 343, 340, 330, 305 and 317 because a transmit single-ended signal over the transmit line (Tx) (303) gets converted to a transmit differential signal over the block segment consisting of blocks 345, 343, 340, 330, 305 and 317 for transmission to a telephone line (130), and a receive differential signal received from the telephone line (130) over the block segment consisting of blocks 345, 343, 340, 330, 305 and 317 gets converted to a single-ended receive signal sent to a receiver (317) [Swisher; Fig. 3; col. 3, lines 48-57]. However, it was well-known that a differential mode of transmission had been used in telephony environment ( col. 2, lines 6-14 of US Patent 6,295,323 B1) for a long time. For example, Stubbe et al [US 5,614,864] teach a converter that shows

single-ended to differential and differential to single-ended conversions [Figs. 5-6].

Further, an automatic gain control (AGC) (312) having a single-ended input coupled to the single-ended receive channel and a single-ended output [col. 5, lines 18-33' col. 3, lines 29-41]; and

a single-ended second filter (i.e. transmit LPF 303) coupled to the transmit channel for filtering the single-ended output signal before conversion to the differential output signal for transmission on the twisted pair telephone line [Figs. 1-3; col. 3, lines 48-57].

In addition, Swisher teaches a single-ended first filter (GDE 311) coupled to the automatic gain control output [Fig. 3] wherein GDE (311) is inherently an all-pass filter. For example, Lai et al [US 6,526,429 B1] teaches that all pass filters may be employed as a group delay equalizer (GDE) for digital subscriber line (DSL) systems to minimize delay spread of a channel [col. 3, lines 55-58; col. 1m lines 14-34; col. 3, lines 46-55].

Claims 77 and 94 are essentially similar to claim 59 and are rejected for the reasons stated above.

Regarding claim 66, Swisher further teaches the AFE, wherein the receive channel comprises an amplifier (313) having automatic gain control [ Fig. 3].

Claim 83 is essentially similar to claim 66 and is rejected for the reasons stated above.

5. Claims 67-69, 84-86, 95-100 rejected under 35 U.S.C. 103(a) as being unpatentable over Swisher as applied to claims 66, 83, 94 respectively above, and further in view of Nabicht et al [US 6,621,346 B1].

Regarding claim 67, Swisher does not teach expressly the structure of the automatic gain control (AGC) circuit wherein the receiver comprises a variable attenuator configured to attenuate the single-ended input signal.

Nabicht et al teach an automatic gain control amplifier (54C), as shown in Fig. 5, having a single-ended input (RXP) and a single-ended output [col. 8, line 54 to col. 11, line 14; col. 11, lines 28-46].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the teachings of Nabicht et al with Swisher in order to provide stable operations of the single-ended circuit in a high-frequency, high precision, and high-data rate modem system [Nabicht et al; col. 4, lines 31-46; col. 9, lines 5-14].

Regarding claims 95-97, see Fig. 4 of Nabicht et al [col. 9, lines 5-14].

Regarding claims 68-69, Nabicht et al further teach the AFE wherein the automatic gain control circuit of the amplifier 54C comprises linear voltage controlled resistors made of semiconductor field effect transistors (MOSFET) shown in Fig. 5, functioning as a variable attenuator configured to attenuate the single-ended input signal [Figs. 4-5; col. 8, line 19 to col. 9, line 59; col. 11, lines 29-55].

Regarding claims 84-86, 98-100, the limitations are shown above.

6. Claims 70-71 and 87-88 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Swisher and Nabicht et al as

applied to claims 69, and 86 respectively above, and further in view of Ouellette [US 4,178,482].

Regarding claims 70-71, although Nabicht et al the structure of an automatic gain control amplifier 54C [Figs. 4, 5; col. 6, lines 4-27; col. 8, line 54 to col. 9, line 14], they do not disclose expressly the structure of a field-effect transistor (MOSFET). It may, however, be noted that the structure of the field-effect transistor is well-known in the art.

Ouellette teaches the structure and configurations of a field-effect transistor (MOSFET) for use in an automatic gain control circuit [Figs. 1-5; col. 2, lines 3-17; col. 5, lines 55-62; col. 11, lines 40-47; col. 11, line 55 to col. 12, line 29].

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to combine the structure and configuration of the field-effect transistor (MOSFET) of the automatic gain control circuit of Ouellette with Swisher and Nabicht et al in order to eliminate frequency

intermodulation and distortion problems at a receiver's AGC circuit  
[Ouellette; col.1, lines 61-68].

Regarding claims, 87 and 88, the limitations are shown above.

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

(i) Rezvani et al [US 6,760,434 B1] teach a dual impedance hybrid [Figs. 2A-3D; Abstract]; and

(ii) Polley et al [US 6,618,480 B1] teach an analog front end for converting a differential signal into a single-ended signal and vice-versa [Figs. 1-2, 4; col. 1, line 29 to col. 2, line 21].

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ramnandan Singh whose telephone number is (571) 272-7529. The examiner can normally be reached on M-TH (8:00-5:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Fan Tsang can be reached on (571) 272-7547. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Ramnandan Singh  
Examiner  
Art Unit 2614

A handwritten signature in black ink, appearing to read 'R. Singh', with a long horizontal line extending from the bottom of the signature.